Refuge Manager, Tewaukon Refuge -
Cayuga, North Dakota

July 1, 1964
In reply refer to: R

Assistant Regional Refuge Supervisor -
Minneapolis, Minnesota

EH-R Tewaukon water mgmt plan

Water Management Plan - 1964 -- Amendment No. 1

Your proposed amendment no. 1 to the 1964 Water Management Plan for Tewaukon Refuge has been approved.

By copy of this memorandum we are asking the Regional Engineer to furnish you design and cost estimates for placing a temporary outlet at Clouds Lake pool to fill pools 5, 6 and 7.

A copy of comments from the Branch of Engineering is attached.

Edward J. Smith

Attachment

cc:
Regional Engineer

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Regional Director, BSF&W, Mpls. 8, Minn. DATE: August 29, 1964

FROM : Refuge Manager, Tewaukon Refuge
Cayuga, North Dakota

EH-R [illegible] water mgmt plan

SUBJECT: Volume of Water Releases

AUG 31

We have recently installed a 12" culvert with a slide gate from Clouds Lake to Pool #9 and will in the near future install a 24" culvert (w/slide gate) from Clouds Lake to Pool #7.

We are interested in learning the volume of water that we can pass through the above culverts at a given opening of the slide gate with a given level of water in Clouds Lake.

James F. Gillett

ENGINEERING

Refuge Manager, Tewaukon Refuge,
Cayuga, North Dakota

September 1, 1964

EH-R Tewaukon
Water Mgmt. Plan

Acting Regional Engineer

Volume of Water Releases (Refuge Manager's memo 8-29-64)

We are unable to provide you with the requested rating curve without first knowing the inlet and outlet elevations of the 12" CMP. We also need to know what length of pipe was installed.

If you will provide us with the above information, we can then develop an approximate rating curve for the control. We might add that it is not too difficult to arrive at full flow values of discharge for this type of installation once the above dimensions are known. However, flow values computed for various openings of the slide gate are somewhat unreliable, especially with a varying head differential.

9-1-64

9-1-64

9-1-64

E. B. Stevenson

CWStephan:rj 9/1/64

ENGINEERING

Refuge Manager, Tewaukon Refuge,
Cayuga, North Dakota

Regional Engineer

September 11, 1964

EH-R Tewaukon
Water Mgmt. Plan

Volume of Water Releases

Reference is made to your conversation with Mr. Kowalski of the Engineering Branch on September 10, 1964, regarding the above subject.

The information you provided our engineer regarding the two CMP installations was as follows:

one 24" CMP, 40 feet long, no slope (Culvert L. To Pool 7)
one 12" CMP, 50 feet long, no slope (Culvert L. To Pool 9)

Stephan 9-11-64

An approximate rating table for these two culverts is as follows:

JDU 9/11

Depth of Water Measured Above or Below The Top of the Pipe Inlet	Discharge in cfs 24" CMP	12" CMP
36"	26	6.2 *
30"	24	5.7
24"	23	5
18"	21	4.6
12"	18	4.0
6"	15	3.25
0"	11	2.0
- 6"	6.5	.68
-12"	3.8	0

The above table is from experimental data on culverts with inlet control and which do not flow full. If by chance the culverts do manage to flow full at some greater depth, the actual discharge capacity will then be larger.

John D. Umberger

CWStephan:rj 9/11/64